

# **STI - 20 / STI- 24**

# Maintenance and Operation Manual



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## 1. Introduction

#### 1.1. The STI-20 & STI-24 Metal Shear

Strip Technology Shears are designed to give long and trouble-free life. The Shear is controlled by a direct acting Foot Pedal. The pressure applied to the Foot Pedal directly corresponds to the running speed of the Shear, and when the Foot Pedal is released the Shear will return to the open position. The Shear is fitted with an automatic Infeed Clamp which, upon pressing the Foot Pedal, clamps down on the material to be sheared before the Blades shear the material, however this can be turned off or operated manually as required.

Remember that scrap metal processing can be hazardous. Before operating the equipment, it is important that you read and understand the safety instructions contained in this manual. Please ensure that your operators are fully trained in the use of the Shear and, should you decide against a service contract, that you conduct periodic safety reviews of the equipment's safety features and Warning Labels. Replacement Warning Labels and other items of safety equipment such as the Blade Guard, Foot Pedal, Control Cable, and Tongs can be obtained at cost from the Manufacturer. If you would like more safety or operating information for this type of scrap metal processing equipment, then this can be obtained by contacting any one of the organisations listed at the end of this manual.

This manual covers electric powered versions of the 20 & 24 Shear.



If you need any further help or assistance, or wish to order parts or a service contract, please contact your local agent or the manufacturer:

Strip Tech 3700 North Commerce Street Fort Worth, Texas 76106 www.striptec.com



#### READ & UNDERSTAND THIS SECTION BEFORE OPERATING THE SHEAR

#### 2.1. Operating Warnings

BEFORE OPERATING THIS SHEAR ENSURE THAT:

- You, as the operator, have read and understood this manual.
- You are fully familiar with the Shear's controls.
- The Blade Guard is correctly fitted and positioned.
- Any Covers are in place and correctly fitted.
- All Warning Notices are clean and legible.
- The Foot Pedal Cable is free from damage.
- There are no obstructions to any air vents or intakes.
- You are wearing appropriate Protective Clothing.
- The working area around the Shear is clear of metal and debris.
- The Hydraulic Oil level is correct.
- Visual Daily Operator Inspection Checks have been carried out.
- You have carried out a Shear Safety Inspection using the Shear Safety Checklist.

DO NOT UNDER ANY CIRCUMSTANCES ATTEMPT TO SHEAR:

- Totally enclosed vessels, cylinders, gas containers, aerosols or any other pressurised container.
- Vessels containing volatile or flammable substances, acids or alkalines.
- Ammunitions, cartridges, or explosive material of any type.
- Hardened or high-speed steels, engine pistons, automotive valves or valve seats.
- Any metal or substance likely to fly from the Blades of the Shear whilst being cut.
- Inflated automobile or lorry tyres.
- Any other substances likely to cause injury to the operator or bystander.

DO NOT:

• Hold more than one item at any time whilst shearing.

- Put hands or fingers into open ends of tubes or cylinders whilst shearing.
- Put hands or fingers in to open sided sections whilst shearing.
- Attempt to cut small items without the use of tongs or long handled pliers.
- Operate from the front, back or right hand side of the Shear.

#### ALWAYS:

- Stand between the material being cut and the Stop/Start controls of the Shear.
- Use the Shear from the left (Control Box) side.
- Always hold lengths of material to the right hand side of the body.
- Use the Infeed Clamp when possible.

#### DANGEROUS WORKING PRACTICES

- Do Not point items to be sheared towards the body.
- Do Not operate the Shear in the manner shown in the following illustrations:



# Infeed material and tools may jerk up or jump out of the closing blades causing injury.





# Always hold infeed materials and tools to the right hand side of the body.



#### 2.2. Warning Labels

The Warning Labels illustrated are examples of those attached to the 20/24 Shear. Keep all notices clean and legible. Replacement labels can be obtained directly from Strip Tec.

#### Label A.



Label B.

SAFETY

operating this machine.

Label C.

Label E.

Label D.





- 3. No persons under the age of 18 should operate this machine.
- 4. Keep the working area around the machine clear from metal or debris.
- 5. The equipment is only to be used for the purpose for which it is constructed.
- 6. Do not attempt to shear pressurised containers, ammunitions, hardened steels, metals likely to fly from the blades of the shear, inflated tyres or any other substances likely to injure the operator or a bystander.
- 7. Use tongs to handle small items.
- 8. Do not hold bundles of items whilst shearing
- 9. Do not put hands or fingers into open ends of tubes or cylinders whilst shearing.
- 10.Under no circumstances are the safety characteristics of this equipment to be altered.
- 11.Daily visual operator checks must be carried out to ensure that all guards and safety features are retained and function correctly.
- 12 Do not wedge foot pedal in operating position.





380/415

Warning machine operating noise levels between 85 and 90 db(A)

Ear protection must be worn when operating this machine.

Label F.



## WARNING!

Do not wedge foot pedal in operating position.

#### Label G.



# WARNING

Shear hazard. One operator only.

Keep hands clear from under blade. DO NOT operate with guard removed. DO NOT operate with guard raised. Turn power OFF before servicing.

#### Label H.

# <text><text><text><text><text><text><text><text><text><text>

# **MARNING!**

Scrap metal handling can be hazardous.

Label I.

Wear protective clothing at all times whether operating, adjusting or servicing this machine.



#### Label K.



#### 2.2.1. Positioning of Labels



Label K



#### 2.3. Important Information

#### 2.3.1. Serial Number Plate

Below is an example of a Strip Tec serial number plate declaring the EEC requirement for a CE Mark along with the gross weight of the Shear and the maximum working pressure of the hydraulic system.

Note: The working pressure and weight is specific to each machine and should not be taken as a standard for similar machines.

Strip Tec	•
MODEL:	
SERIAL NO:	
DATE OF MANUFACTURE: MAXIMUM WORKING PRESSURE:	
GROSS WEIGHT: JMC Recycling Systems Ltd Marrimans Lane, Duckirk, Notlingham, NG7 25D, England	KGS
	Stripp Tees   MODEL:   RATING:   SERIAL NO:   DATE OF MANUFACTURE:   MAXIMUM WORKING PRESSURE:   GROSS WEIGHT:   JMC Recycling Systems Ltd Hartmane Auge Augekirk, Notstingharn, NG7 250, England

#### 2.3.2. Electric Motor Rotation

Electric motor rotation is clockwise at the fan end.



#### 2.3.3. Continual Improvement Policy

Strip Technologies reserves the right to make changes and/or improvements to our machines without obligation to incorporate such changes on machines previously sold.

#### 2.4. A Cautionary Tale

The STI-12 model shear pictured below came into the manufacturer's works for reconditioning and resale in May 2001. It had been operating in the field since November 1989. At some time during it's history, the Shear had been refurbished by someone other than the manufacturer. The Blade Guard had been removed and not re-fitted. The Foot Pedal had been modified by removing a large section of shielding. Removal of the Foot Pedal shrouding could result in accidental operation of the equipment by either the operator, someone stumbling onto the Pedal, or even a piece of falling metal. All Warning Labels had been removed.

Modifications of this type cannot be condoned since they could result in serious injury to the operator. If you see, are offered, or are asked to work on a Shear which has been altered in such a way as to compromise operator safety, then please contact the manufacturer, trade organisation, and/or your local Health and Safety Executive. Replacement Guards, Foot Pedals, Cables and Warning Labels can be obtained at cost from the manufacturer.





## 3. Installation

#### 3.1. Lifting & Transporting

For safe movement of the Shear there are two Fork Lift Channels as shown below. Use at all times when lifting the Shear and check the capacity of the equipment to be used.



#### 3.2. Siting & Installation

The Shear must be sited on level ground, ideally on sound concrete, and in good ambient lighting. The Shear must not be allowed to rock back and forth while in operation. Site the Shear in a position which will allow The Operator to walk freely and unhindered around all sides. Ensure that the working area around the Shear is kept clear of metal and debris.

It is good practice to site the Shear at a wharf or raised dock so that sheared material falls away from the Shear into a container. Any method that makes it unnecessary for an operator to retrieve sheared material is preferred and usually more productive.

#### 3.2.1. Electrically Powered Models

The Shear installation requires a three phase electrical supply. As part of the installation, we strongly recommend the use of an earth leakage trip or Residual Current Detector (RCD).

Ensure that the electrical supply is compatible with the Shear. Use armoured supply cable complying with local regulations. Route the supply lead in such a manner as to leave it free from trapping points and areas where it is likely to hinder the efficient operation of the Shear, or cause a hazard.



Keep the Shear and its fuel supply away from sources of ignition and from flammable sources.

#### 3.3. Hydraulic Oil

Do not run the Shear before filling the Hydraulic Tank with hydraulic oil; do not use a liquid other than hydraulic oil. Fill up to the heavy black line on the Level gauge.

Recommended oil types:

- BP HLP 46;
- Shell Tellus Oil 46;
- Mobile DTE 25;



Monitor the oil temperature and do not allow it to exceed 150 Degrees

4. Operation of the Shear



The shear must only be operated by a single person at any time. Persons operating the Shear must have received adequate training and have read and understood this manual



Use the Shear Safety Checklist at least once a day.

#### 4.1. Starting & Stopping Electrically Driven Models

4.1.1. Start & Stop Buttons

Pressing the green button marked 'START', or 'I', will energise the starter, and in turn start the Electric Motor on the Shear. If, on pressing the green Button, the Motor fails to start, ensure the E-Stop Button has been reset and the Isolator Switch is set to the ON position.

Pressing the red Button marked 'STOP', or 'O', stops the electric motor on the Shear. This button also acts as the reset for the thermal overload trip switch used to protect the electric motor.

It is good practice to test the Stop Button each time you start up the Shear. The Stop Button must be kept in good working order to protect the Operator.

#### 4.1.2. Use of the Electrical Isolator Switch

If the Shear is not to be used for long periods of time or if maintenance is to be carried out, set the Isolator Switch to the OFF position.

#### 4.3. Foot Pedal Control

#### 4.3.1. Using the Foot Pedal

Always start up the Shear before depressing the Foot Pedal. Depressing the Foot Pedal activates the shearing action at a speed controlled by the amount of depression. Releasing the Foot Pedal Plate should always return the Top Jaw of the Shear to the open position. The Foot Pedal should be placed so that easy up and down movement of the Foot Pedal Plate can be achieved.

When the Foot Pedal is depressed, the Top Jaw of the Shear will close until the Top and Bottom Blade meet each other. If the Foot Pedal is held at mid point of travel, the movement of the Top Jaw will stop, both on the up and down stroke. This enables the Shear to nip and hold an item to be sheared.

The Ram stroke will repeat automatically by keeping the Foot Pedal in the fully depressed position.

The Foot Pedal is fully shielded to prevent accidental operation of the equipment. The Foot Pedal Cable is direct-acting, ensuring that the Shear always returns to the fully open position when pressure is released from the Foot Pedal. Always check that the Foot Pedal Cable is free from damage or kinks before operating the equipment.



Only a single person must operate and feed the Shear. Do Not operate the Shear if the Foot Pedal is damaged. Do Not wedge the Foot Pedal in the down position. Do Not modify the Foot Pedal.

#### 4.3.2. Siting the Foot Pedal

The Foot Pedal should be sited slightly forward of the Shear and to the left hand side of the Shear, giving the operator easy access to the control buttons.



Only operate and feed the Shear from the LEFT (Control Box Side).

#### 4.4. Adjusting the Stroke

The Top Jaw opening may be adjusted to suit the type of material being sheared. To achieve this:

- First stop and switch off the Shear with the Jaws in the closed position.
- Loosen the Wing Nut on the Stroke Control Mechanism.
- Slide the Stroke Adjuster up or down the Stroke Adjuster Rod. Sliding to the FRONT lengthens the stroke, sliding to the REAR reduces it.
- When the desired position has been obtained, tighten the Wing Nut to lock the Stroke Adjuster in place.



Always switch off and isolate the Shear from the mains electrical supply before adjusting the Stroke Adjuster Mechanism.

#### 4.5. The Blade Guard

Ensure that the Blade Guard is correctly fitted and in place. Do not attempt to raise the Blade Guard, except for maintenance.



Do not use the Shear if the Blade Guard is; incorrectly fitted, broken, bent or if the securing bolts are loose or missing.

Only raise the Blade Guard for maintenance purposes.



Do Not use the Shear without the Blade Guard in Place. Do Not use the Shear with the Blade Guard in the raised position.

#### 4.6. Protective Clothing

The following Protective Clothing must be worn at all times, for operating and maintaining the shear:

- Safety Goggles with side screens or Full-Face Visor
- Safety Helmet (Hard Hat)
- Steel Toe Capped Safety Boots
- Gloves and Protective Apron

#### 4.7. Infeed Clamp

The shearing action can cause the material being sheared to kick up or skid forward in the jaws. As a preventative measure, the Shear is fitted with a Hold-Down or Infeed Clamp to firmly grip the material.



Infeed Clamp Control Lever

The Infeed Clamp operates automatically if the Control Lever is in the 'RUN' position whenever the Shear is in motion, the Infeed Clamp will move with the same motion as the Top Jaw. It will clamp down on to the item to be sheared with a holding force of up to 7 tons.



The Infeed Clamp must be treated with the same respect as the Shear Blade.

For heavy sections the Infeed Clamp is best locked off just above the item to be sheared. This is achieved by turning the control lever to the 'LOCK' setting, this will lock the Clamp in any position along its travel.



Always adjust the motion or position of the Clamp to suit the material being sheared.

#### 4.8. Shearing Large Items

Always hold materials on the right hand side of the body.

Adjust the operation of the Infeed Clamp to suit the material to be cut.

If the Jaw stops moving part way through cutting a large item. Ensure that the material to be cut is within the capacity of the Shear, if it is try to cut the material again ensuring that the Foot Pedal is fully depressed. If the Jaw stops again consult the Troubleshooting Guide (See Section 6.1, Page 28)



#### Do Not point any items to be sheared towards the body.



#### 4.9. Shearing Small Items

When shearing small items, always use tongs or long handled pliers in order to keep hands well clear of the Blade and Infeed clamp.



Do Not hold small items directly by hand.

## 5. Periodic, Routine Care & Maintenance

#### 5.1. Introduction

Most sites on which the Shear may be operated are by their nature extremely dirty. You will see from the following Routine and Periodic Maintenance Schedule that emphasis is placed on regularly cleaning some aspects of the Shear. To this end, we also strongly recommend that a good quality industrial vacuum cleaner be acquired as part of the maintenance kit.

#### 5.2. Warnings



- For electrical adjustments and/or inspections, use Qualified Personnel, familiar with the latest I.E.E. Regulations, or local equivalent.
- Wear full protective clothing when carrying out maintenance on this shear.
- Do not modify in any way, the mechanisms or intended operation of this equipment.
- For safety and to achieve optimum performance only use genuine Strip Tec approved parts. Use of non-approved parts may invalidate the warranty.

#### 5.3. Hydraulic Fluid

#### 5.3.1. Storage, Handling & Disposal

- Store hydraulic fluids under cover away from sources of heat.
- Dispense carefully into clean containers and avoid contact with skin or eyes.
- Use local official collection points for disposal. Do not pollute drains or soil.

#### 5.3.2. First Aid Measures

- EYE: Flush with water for 15-20 minutes. Seek medical attention if irritation develops.
- SKIN: Wash immediately with soap and water. Remove contaminated clothing and launder before reuse. Discard shoes and leather articles saturated with the product. Obtain medical advice if irritation occurs.
- INHALATION: Remove exposed person to fresh air. If breathing is laboured give oxygen. If breathing has stopped apply artificial respiration. Get immediate medical attention.

- INGESTION: DO NOT INDUCE VOMITING. If conscious, give 2 glasses of water. If vomiting does occur, keep head below hips to reduce risk of aspiration. Get immediate medical attention.
- Used oils pose a higher health risk and suitable measures should be taken to avoid continuous or repeated contact with them.

#### 5.3.3. Fire Fighting Measures

• Use carbon dioxide, dry chemical or alcohol foam.



#### Never use Water to combat any Oil or Fuel Fire.

- Avoid spraying directly into storage containers because of the danger of boil over.
- Water may be used to cool nearby heat exposed areas / objects / packages.
- Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water.
- Combustion Products: Toxic fumes may be produced on burning or exposure to heat.



Fires in confined spaces should be dealt with by trained personnel wearing self contained breathing apparatus.

#### 5.5. Daily Operator Inspection



# Always switch off and isolate the Shear from the mains electrical supply and remove the key before maintenance.

- 1. Check and top up the hydraulic fluid level if necessary. (See Illustration 1A, Page 43).
- 2. Check for signs of hydraulic fluid leaking from Hydraulic Hoses, Rams and Power Pack. Report any defect to The Supervisor.
- 3. Check for loose, missing or damaged items such as Cables, Switches, Covers, Signs and Warning labels, flat or blistered Hoses. Report any defect to The Supervisor.
- 4. Check the Electrical Cables are intact and fully shielded and insulated. Report any defect to The Supervisor.
- 5. Check that the Shears Mains Isolator operates correctly. Check that the Stop Button and Emergency Stop Buttons are working correctly.
- 6. Ensure that the housing of the Foot Pedal control is free from debris and any obstructions to the mechanism. Ensure that the Foot Pedal Plate moves smoothly in both directions, and rests in the uppermost position. Report any defect to The Supervisor.
- With the Top Jaw in the fully down position, ensure the Shear is switched Off and Isolated from the mains power supply and key removed.
   Check that the Shear Blades are intact, seated correctly and free from chips or breakages. (See Illustrations 3A-3B, Page 45). Report any defect to The Supervisor.
- 8. Ensure that the immediate area around the Shear is clean and free from any obstructions, metal or debris underfoot. This will prevent accidental stumbling or slipping. Ensure that you can operate the Shear comfortably and that you have good visibility of all working parts.
- 9. Ensure that all ventilation grills are free from obstruction.
- 10. Ensure all warning labels are present, clear and legible. Report any missing or damaged labels to The Supervisor.
- 11. Report any defect, unusual occurrence or incident to The Supervisor.



Use the Shear Safety Check list at least once a day



Never run with low fuel. Never let the system run dry.

#### 5.6. Weekly Routine Maintenance



Always switch off and isolate the Shear from the mains electrical supply and remove the key before maintenance.

- 1. Grease the Main Pivot, the Take Up Screw, and 2 Main Ram Pivots. (See Illustrations 2A & 2B, Page 44)
- Grease the Infeed Clamp Pivot and Hydraulic Ram Pivots. (See Illustration 2A & 2B, Page 44)
- Test the Shear Blades, for tightness and correct adjustment. (See Illustration's 3A & 3B, Page 45)
- 4. Test the Foot Pedal control for correct adjustment. (See Illustration 4A, Page 46)
- 5. Vacuum or brush down the Power Pack and Blade Guard.
- 6. Vacuum or wipe down the Warning Labels and ensure that they are legible at all times.
- 7. Vacuum or wipe down the Control Box Legend and Instruction Plates. Ensure that all are legible.

Note: The grease used for routine lubrication must be suitable for both Nylon 66 and Phosphor Bronze Bearings.

#### 5.7. Three Month Periodic Maintenance



# Always switch off and isolate the Shear from the mains electrical supply and remove the key before maintenance.

To include previous items 1 to 7.

- 8. Check and top up the hydraulic fluid level if necessary. (See Illustration's 1A & 1B, Page 43)
- 9. Test the Top Jaw Main Pivot for side movement and the Take Up Screw and Lock Nut for tightness. (See Illustration 2A, Page 44)
- 10. Clean off any excess grease from the Top Jaw Main Pivot and Thrust Pad.
- Apply a light oil to the Top Jaw Stroke Adjuster Mechanism. (See Illustrations 4C & 4D, Page 47)
- 12. Apply a light oil to the Foot Pedal Chain, the pivot of the Chain Housing, both ends of the Foot Pedal Cable and the Foot Pedal pivot (See Illustration's 4A & 4B, Page 46).
- 13. Check the Stroke Adjuster Springs are intact and not squashed. Replace if damaged. (See Illustration 4D, Page 47).
- 14. Examine the Hydraulic Hoses for scuffing, replace if damaged and re-route if needed.
- 15. For Electrical Models: Remove the Pump Motor fan cowl with care to expose the Motor ventilation impeller. Vacuum the impeller and the Motor cooling fins. Replace the fan cowl, check the Motor Terminal Box Cover fixings for tightness.
- 16. Examine and test all Shear Blade fixings. Use only well-fitting hexagon wrenches if adjustment is needed. (See Illustration's 3A & 3B, Page 45)
- 17. Examine and test the Foot Pedal ensuring a clearance of 6mm (0.25in) between the Foot Pedal Plate and the Housing when in the fully depressed position (See Illustration 4A, Page 46).
- 18. Examine the Foot Pedal Cable for kinks and breakages. Replace if damaged. (See Section 6.13, Page 42)
- 19. Restore the mains power supply, or start up the engine, and test that the Shear functions correctly.

#### 5.8. Twenty-Four Month Periodic Maintenance



#### Always switch off and isolate the Shear from the mains electrical supply or turn off the Diesel Engine and remove the key before maintenance.

To include previous items 1 to 20.

- 21. Change Pump Suction Filters. (See Section 6.11, Page 39)
- 22. Grease the Main and Infeed Clamp Hydraulic Rams Rear Cylinder Pivot until grease squeezes out between the clevis flanges. (See Illustrations 2A & 2B, Page 44)

#### 5.9. Forty-Eight Month Periodic Maintenance



#### Always switch off and isolate the Shear from the mains electrical supply or turn off the Diesel Engine and remove the key before maintenance.

To include items 1 to 22.

- 23. Renew the Hydraulic Fluid. Due to the high cost of hydraulic fluids, it might first be worth asking your local oil supplier if they can revitalise the fluid in situ. If the only course of action is to change the fluid. (See Section 3.4, Pages 12-13 for the quantity required) Press down and turn anti-clockwise to unscrew the Filler Cap. (See Illustration 1A, Page 43). Located at the rear of the Oil Tank is a drain plug (See Illustration 1B, Page 43). Choose a suitable container or containers to drain the old oil into. Remove the Drain Plug from the tank but keep the plug close to hand to stop the flow quickly if needed. Refill the tank to the heavy black line on the sight gauge. Use only ISO 46 grade hydraulic fluid.
- 24. Renew the Hydraulic Filler Breather Cap. Contained within the Filler Cap is a 10 micron filter element preventing air born dusts from contaminating the hydraulic fluid. It is good practice to renew this filler cap when filling the Hydraulic Tank with a substantial quantity of new hydraulic fluid.

## 6. Servicing & Repair

#### 6.1. Troubleshooting - General



Always switch off and isolate the Shear from the main electrical supply and remove the key before maintenance.

6.1.1. Hydraulic Fluid is getting hot



#### The oil temperature Should Not exceed 150 degrees

The possible reasons for hydraulic fluid getting hot are numerous. The following are some of the main causes:

- A. Ensure items being processed are within the capabilities of the Shear.
- B. Power pack needs topping up with hydraulic fluid. Refill to heavy black line on sight gauge.
- C. Motor cooling fan and fins need cleaning.
- D. Hydraulic Pump Suction Filter clogged. Replace with new Filter.
- E. Split or loose Hydraulic Hose and/or connections inside the Hydraulic Tank.
- F. Hydraulic Control Valve is not moving full stroke. Check for dirt or a bent Valve Spool. Also check Valve Spring is intact and undamaged.
- G. Hydraulic Ram seals need renewing. Test the Ram by bottoming out and monitoring return flow of hydraulic fluid.
- H. Pump fitting cracked or seal burst. Replace the Hydraulic Pump. Also check Relief Valve setting.



Maximum relief valve setting 3500PSI.

I. Pump bearings worn out and Pump body scored. Check Suction Filter for aluminium filings. Replace Pump and Suction Filters.

#### 6.1.2. The Shear runs too slowly

- A. Check D to I as for 6.1.1.
- B. Check the Sequence Valve (See Sections 6.6 & 6.7 Pages 32-33) setting, the adjuster should be fully unscrewed (lowest setting).

#### 6.1.3. Loss of power when cutting heavy items

- A. Check that the clearance between the Foot Pedal Plate and Housing is not less than 6mm (0.25in) when in the fully depressed position, (See Illustration 4A, Page 46).
- B. Check D to I as for 6.1.1.
- C. Check Motor to Pump drive couplings for slippage.
- 6.1.4. The Shear will not Repeat Stroke
- A. Examine the Stroke Adjuster Springs. Replace if squashed or damaged.
- B. Ensure the Foot Pedal is free to move and that the Foot Pedal Cable is correctly connected and undamaged.
- 6.1.5. The Hydraulic Fluid becomes aerated or frothy
- A. Hydraulic fluid return line hose from the Control Valve to the Hydraulic Tank is loose. Check all hoses are undamaged and correctly tightened.
- B. Hydraulic pump shaft seal worn out. Replace Hydraulic Pump.

#### 6.2. Troubleshooting - Electric Models



# Always switch off and isolate the Shear from the mains electrical supply before maintenance.

- 6.2.1. The Motor trips out due to overload or overheating
- A. Ensure the items being sheared are within the capabilities of the Shear.
- B. Check the Motor Fan Blades and air passageways are clear from dust and debris.
- C. With the Shear Isolated from the electrical supply, open the Electrical Control Box and reset the contact overload.

#### 6.2. Electrical Cable Schedule - Three Phase

Cable No.	Size	Cores	Cable	Source	Destination
SO	8-10ga	4	THW	32A Plug	Main Control Panel Isolator
SO	8-10ga	4	THW	Main Control Panel	Pump Motor

#### 6.2.1. STI001



Source: 32A Plug

Destination: Main Control Panel Isolator

Core No.	Plug Terminal No.	Isolator Terminal No.	Function
Earth	Earth	Earth	Earth
1	1	L1	Power Supply
2	2	L2	Power Supply
3	3	L3	Power Supply

#### 6.2.2. STI002





Source: Main Control Panel Relay

Destination: Pump Motor

Core No.	Relay Terminal No.	Motor Terminal No.	Function
Earth	Earth	Earth	Earth
1	2 -T1		Motor Winding
2	4 -T2		Motor Winding
3	6 -T3		Motor Winding

# 6.4.1 WIRING FOR A 110-220 SINGLE PHASE





6.4.2 WIRING FOR A 220-440 THREE PHASE

#### 6.6. Hydraulic Circuit Diagram - Electric Models



#### 6.8. Raising the Blade Guard

(See Illustration's 5A & 5B, Page 48 and Section 8.2, Page 52)



# Always switch off and isolate the Shear from the main electrical supply and remove the key before maintenance.

The Blade Guard may be raised for maintenance purposes only; primarily blade adjustment, turning and changing. Once maintenance is complete it must be repositioned and refitted correctly before the Shear is operated.

6.8.1. To Raise The Guard:

- Loosen the Pivot Bolt, Item 6, and the Grease Screw, Item 2, . DO NOT REMOVE.
- Remove the Locking Bolt on the Operator side.
- Lift the Blade Guard to expose the tapped hole for the locking bolt. Refit the Locking Bolt behind the upright channel. The Bolt now acts as a stop preventing the Guard from rotating down.

6.8.2. To Lower The Guard:

- Support the Guard at the front and remove the Locking Bolt.
- Lower the Guard and refit the Locking Bolt and tighten. Tighten up both Pivot Bolts.



Do Not operate the Shear without the Blade Guard correctly fitted. Do Not operate the Shear with the Blade Guard raised. Only raise the Blade Guard for maintenance purposes. Do Not remove the Guard Pivot Bolts.

#### 6.9. Shear Blade Turning & Changing

(See Illustration's 5A & 5B, Page 48 and Section 8.2, Page 52)



Always switch off and isolate the Shear from the main electrical supply and remove the key before maintenance.



#### Always wear Gloves when handling Blades. Only use Strip Tec Blades.

#### 6.9.1. Introduction

The Blades supplied with the Shear are not re-grindable, however they have four cutting edges and can be rotated through eight cutting positions.

# Note: The fixing screws are smeared with copper based grease to aid subsequent removal.

#### 6.9.2. Replacing or Turning the Top Blade

- Close the Top Jaw, stop and isolate the Shear from the electrical supply and remove the key.
- Remove the Top Blade, Item 19 and the Top Blade Seating Plate, Item 20.
- At this point, examine the Top Blade Seating Plate and Top Jaw where the Blade sits, it should be flat and burr free, file off any burrs. It is important that the Blade sits against the Jaw without any gaps. Rectify if this is not the case.
- Remove any burrs from the Top Blade, choose a new cutting edge and rest the Top Blade Seating Plate and the Top Blade. Ensure that the Top Blade Screws, Items 22, are tight.

#### Note: Top and Bottom Blades are interchangable and should be replaced or turned at the same time for optimum Blade life and cutting performance.

#### 6.9.3. Removing side movement from the Main Pivot

Excessive side movement in the Main Pivot Bearing will negate Bottom Blade settings. It is necessary to remove any side movement in the Main Pivot before resetting the Bottom Blade.

- First unscrew the Take-Up Screw, Item 28, by about six turns.
- Remove the Pivot Lock Nut's Grub Screw, Item 25.
- With the aid of a soft drift or peg spanner tighten the Pivot Lock Nut, Item 26, as far as possible.
- Replace Grub Screw and tighten.
- Re-tighten the Take-Up Screw.

#### 6.9.4. Replacing or Turning the Bottom Blade

Before replacing or turning the Bottom Blade remove any side movement from the Main Pivot as any side movement will negate Bottom Blade setting and will reduce cutting ef ciency and Blade life.

- Close the Top Jaw, stop and isolate the Shear from the electrical supply and remove the key.
- Remove the Bottom Blade, Back Up Plate, Anvil Bracket and the Bottom Blade Seat Plate, Items 19, 18, 13 and 12.
- Unscrew the Dog Point Grubscrews, Items 12, until they are no longer protruding from the Bottom Jaw.
- Inspect the Bottom Jaw, Bottom Blade Seat Plate and Back Up Plate, they should be flat and free from any burrs, file off any burrs or change the Back Up Plate or Seat Plate if necessary.
- Re t the Seat Plate with the Socket Head Cap Screws, Items 17. Then slide the Bottom Blade and Back Up Plate into place, with a new cutting edge selected,
- Rest the Anvil Bracket and loosely cut the M16 Cap Screws, Items 13.
- Adjust the M16 Cap Screws and the Grubscrews, using feeler gauges, until the gap between the Top and Bottom Blades is 0.05mm along the length of the Blade.
- Ensure all the M16 Cap Screws are fully tightened this should increase the gap to 0.1mm along the length of the Blade. This is the correct gap setting.



Never set the Blades in hard contact with each other.

- At no time must the Top and Bottom Blades be set in hard contact with each other, this can be dangerous to the operator and will also result in short Blade life.
- The M16 Cap Screws should not protrude from the Blades when fully tightened, Rectify if this is the case.
- Replace and correctly position the Blade Guard if removed or repositioned. It is good practice to grease where the Blade Guard sits on the Main Pivot before reassembly whenever the Blade Guard is removed.

Before starting the Shear ensure the Blade Guard is in place and correctly positioned.



# Never operate the machine with the Blade Guard Removed or in the raised position.

On starting up the Shear the Top Jaw will automatically return to the Open position. On first closing of the Jaws exercise a slow controlled approach speed and ensure no hard contact of Blades exist. Rectify if hard contact occurs.

#### 6.10. Resealing the Hydraulic Rams

(See Section 8.3, Page 53)

The procedure described here is for the Main Hydraulic Ram, however the procedure for the Infeed Clamp Ram is similar.



Always switch off and isolate the Shear from the main electrical supply and remove the key before maintenance.

• Before removing the Hydraulic Ram from the Shear, ensure that a chock has been fitted between the Blades of the Top and Bottom Jaws, this will stop the Top Jaw swinging down and causing any damage or injury.



Always chock the Top Jaw or Infeed Clamp to stop movement.

- Fully protect the extended chrome Piston Rod, Item 11, from scuffs and bruises. Plug all disconnected hydraulic pipes and fittings. Also plug the Cylinder, Item 1, ports.
- Remove the Hydraulic Ram to a clean area, preferably under cover away from the weather. Protect from dirt or dust. Ensure that the Ram is safely supported remembering that the centre of gravity will change as it is dismantled.
- Hold the main Cylinder Body, in a vice, taking care not to deform the Cylinder tube.
- With a peg spanner or strap wrench unscrew the Ring Nut, Item 13, and pull the Piston Rod out of the Cylinder with all internals attached.

- The Ram Seal Kit consists of Items: 4, 5, 6, 12, 14 and 16. When removing seals from the Hydraulic Ram make notes of any seal identification marks and note the relevant position of the seal marks relative to the Piston Rod or Cylinder. Ensure that new seals have the same identification marks as the seals previously fitted to the Ram.
- Remove the Grubscrew, Item 2, from the Rear Piston Half, Item 3. Once removed, unscrew the Rear Piston Half and slide all components off the Piston Rod. Inspect the Piston Rod and remove or polish out any burrs or score marks. Deep score marks to Piston Rods may be temporarily filled with an epoxy putty providing that it is properly applied.
- Remove the Wiper seal, Item 12, from the Ring Nut. Examine for burrs and score marks. If all seems satisfactory, fit a new Wiper Seal and slide the Ring Nut back onto the Piston Rod.
- Remove the 'O' ring, Item 16, and the Single Acting Seal, Item 14 from the Gland, Item 15. Examine for burrs and score marks. If all seems satisfactory, fit a new 'O' ring along with a new Single Acting Seal - note, fit radiused and numbered side of seal inward and towards the pressure, the flat side facing outward. Then slide the Cylinder Gland on to the Piston Rod.
- Remove the 'O' Ring and Piston Seals, Items 6, 5 and 4, from the Front and Rear Piston Halves, Items 7 and 3. Examine both Piston Halves for burrs and score marks. If all seems satisfactory, fit a new Piston Seal. Also fit new 'O' rings. Slide the assembly on to the Piston Rod. Screw the Rear Piston Half onto the Piston Rod. Ensure that the rear holes line up exactly, and refit the Grubscrew. Ensure the Grubscrew does not protrude from the end of the Piston Rod, rectify is this is the case.
- Wipe out the Ram Cylinder and ensure that the Cylinder bore is free from any score marks. If this is not the case, it will be necessary to polish out any light score marks. Otherwise seal damage will occur the instant the Hydraulic Ram is put under pressure. Deep score marks to Cylinder bores can not be adequately repaired - replace the cylinder. When all seems satisfactory, smear the Cylinder bore with Hydraulic Oil and refit the Piston Rod assembly into the Ram Cylinder.
- Tighten the Ring Nut.
- Examine the Cylinder clevis and the Piston Rod clevis bores for burrs and any defects. Test the bores with the appropriate Clevis pins prior to refitting the Hydraulic Ram.
- After refitting the Hydraulic Ram to the Shear, check the fluid level in the Hydraulic Tank before start-up and after the first cycle. If necessary top up with clean Hydraulic Fluid.



Only use genuine Strip Tec approved seals and parts. Use of non-approved parts may invalidate the warranty.

#### 6.11. Changing Suction Filter

(See Illustration's 6A-8B, Pages 49-50 and Sections 8.5 & 8.6, Page 55-56).



# Always switch off and isolate the Shear from the main electrical supply and remove the key before maintenance.

#### 6.11.1. Electric Models

- Isolate the Shear from the Mains Power Supply. Disconnect the motor cable at the Motor Terminal Box
- Unscrew the 14 Tank Lid Screws, Items 7.
- Using a Forklift, lift the Tank Lid off the Tank Bottom exposing the Hydraulic Pump and Suction Filters.
- Unscrew the Filters from the Pump fittings and replace.
- Reassemble in reverse ensuring all Tank Lid Screws are correctly tightened.

#### 6.11.2. Diesel Models

- Turn off the Diesel Engine and remove the key.
- Disconnect hoses 500-17D and 500-16D from the Suction Filter Plate, Item *TBC*.
- Unscrew and lift up the Suction Filter Plate to reveal the Suction Filters taking care not to damage the Gasket, Item *TBC*.
- Replace the Suction Filters and reassemble in reverse.

#### 6.12. Hydraulic System Relief Valve

This section requires the use of a combined flow and pressure meter capable of measuring pressures from 0 to a minimum of 250 bar.

#### 6.12.1. Testing for Over-Pressure

With the Shear switched off and isolated from the mains electrical supply and the key removed:

- Install a pressure gauge in to the hydraulic system at the junction of the Hydraulic Tank Bulkhead fitting and the Pressure Line Hose number 500-4 (See Section 6.6 & 6.7, Pages 32-33).
- Place a substantial item, known to be above the shearing capacity of the Shear and long enough to pass under the Infeed Clamp, into the Shear **a** w. Lock the Infeed Clamp in the down onto the item then turn on and start up the Shear.

• Keep a watchful eye on the pressure gauge and slowly depress the Foot Pedal until the pressure gauge reading is stable. If the pressure gauge reading is above the maximum operating pressure of the Shear, the System Relief Valve must be reset to the maximum operating pressure 3500 PSI.

IMPORTANT SAFETY Note:

A pressure gauge reading of less than the maximum operating pressure is not to be taken as requirement to readjust the Hydraulic System Relief valve. Pressure loss elsewhere in the hydraulic system will also give a low pressure gauge reading (See Section 6.1 on Troubleshooting and if uncertain contact the Manufacturer).

6.12.2. Resetting



Always switch off and isolate the Shear from the main electrical supply and remove the key before maintenance.



#### Maximum Relief Valve setting is 3500 PSI

With the Shear switched off and isolated from the mains electrical supply and the key removed:

- Install a pressure and flow meter in to the Hydraulic System, at the junction of the Hydraulic Tank bulkhead fitting and the pressure line hose number 500-4 (See Sections 6.6 & 6.7, Pages 32-33). Ensure that the flow meter value is fully open to give no resistance.
- Turn on and start up the Shear. Keep a watchful eye on the flow meter pressure gauge, and slowly close the flow meter valve until, and not more than 3500PSI is reached. This will establish that the Hydraulic Pump is able to produce the maximum working pressure of the Shear.
- Ensure that the Shear Top Jaw is in the fully open position. Switch off and isolate the Shear from the mains electrical supply and remove the key.
- Disconnect the flow meter, and reconnect hose number 500-4 to the Hydraulic Tank bulkhead. Disconnect pressure line hose number 500-6 from the rear port of the Hydraulic Cylinder, and connect this hose to the inlet side of the flow meter. Remove the Filler Breather Cap from the Hydraulic Tank, and use a short hose from the outlet of the flow meter to the tank filling point, completing the circuit.
- Ensure that the flow meter valve is fully open, to give no resistance. Locate the Foot Pedal control to a comfortable operating distance from the flow meter. Start

up the Hydraulic Pump motor and keep a watchful eye on the flow meter pressure gauge. Fully depress the Foot Pedal control and keep it depressed. At the same time, slowly close the flow meter valve until one of two things happen :

- 1. The pressure gauge reading stops increasing at or below 3500 PSI.
- 2. The pressure gauge reading continues increasing and passes 3500PSI



Do not for any reason allow the pressure to rise above 3625psi.

- At this point release the Foot Pedal and allow the Shear to run in neutral for a few minutes. This will prevent the Pump Motor from overheating.
- If the hydraulic pressure is above 3500 PSI do not alter the flow meter setting. Depress the Foot Pedal and, with the aid of a 16mm spanner loosen the Relief Valve Lock Nut and reset the System Relief valve by turning the Relief Valve Adjustment Grubscrew anti clockwise until the flow meter pressure gauge reading is 3500 PSI. Nip up the Relief Valve Lock Nut, ensure that the pressure gauge reading has not altered, and release the Foot Pedal.
- If the hydraulic pressure is below 3500 PSI, alternate between slowly closing the flow meter valve and turning the Relief Valve Adjustment Screw clockwise until the hydraulic pressure is slightly above 3500 PSI. Then, by adjusting only the System Relief Valve, lower the hydraulic pressure to 3500 PSI. Nip up the Relief Valve Lock Nut, ensure that the pressure gauge reading has not altered, and release the Foot Pedal.
- After either of the above, switch off and isolate the Shear from the mains electrical supply and remove the key.
- Reconnect all hoses, examine the Hydraulic Fluid Level Gauge and top up if needed. Return the Filler Breather Cap.



Check all hose connections are secure and Do Not leak before running the machine for long periods.

#### 6.13. Foot Pedal Cable

(See Illustration's 4A & 4B, Page 46 and Section 8.7, Page 57)



# Always switch off and isolate the Shear from the main electrical supply and remove the key before maintenance.

#### 6.13.1. Renewing the Foot Pedal Cable

To fit a new Foot Pedal Cable, first remove the old Cable by starting at the Foot Pedal and work towards the Shear.

- Remove the Clevis, Item 50, and Horseshoe Clip Pin, Item 52.
- Slide the PVC Dust Cap, Item 53, off the Cable
- Remove the Cable Cleat, Item 47, and fixings, Items 49, 48 and 56. Note the position of the Cable relative to the Mounting Plate and remove the Lock Nut, Item 54, releasing the Cable from the Foot Pedal Housing.
- At the Shear end of the Cable, slacken off the Chain Link Adaptor Lock Nut, Item 43. Turn the inner part of the Cable to unscrew the Cable from the Chain Link Adaptor, Item 40.
- Note the position of the Cable relative to the Mounting Bracket. Slide the PVC Dust Cap upwards, and unscrew the inside Lock Nut, Item 45, thereby releasing the Cable from the Shear.
- Lightly oil each end of the new Foot Pedal Cable, and using the saved Clevis parts, refit the new Cable in reverse. Take care to press home the PVC Dust Caps at each end of the Cable.

#### Note: Replacement parts are available at cost from Strip Tec

#### 6.13.2. Adjusting the Foot Pedal Cable

Use the Lock Nuts either side of the Mounting Plate inside the Foot Pedal to raise and lower the Foot Pedal Plate position. When the Foot Pedal Plate is fully depressed, ensure that a clearance of 6mm (0.25in) is maintained between the Foot Pedal Plate and the bottom of the Foot Pedal Housing.



Do not modify in any way the mechanism or the intended operation of the Foot Pedal control. Never adjust the Foot Pedal Plate to be higher than the Sides of the Foot Pedal Housing

## 7. <u>Illustrations</u>

7.1. Hydraulic Tank

1.A.



1.B.

Hydraulic Oil / Drain Plug



#### 7.2. Grease Points



Motor Fan Cowling

Infeed Clamp Pivot Grease Point

#### 2.B.



#### 7.3. Blades



3.B.



#### 7.4. Stroke Adjuster & Foot Pedal





#### 7.5. Blade Guard

5.A.



Guard Pivot Screw

5.B.



Blade Guard Pivot Screw

> Blade Guard Locking Screw

#### 7.6. Electric Motor

6.A.



Motor Terminal Box

#### 7.8. Pump & Bell Housing





## 8. Spare Parts

#### 8.1. Ordering Spare Parts

When ordering spares you will need the following:

- Type of equipment
- Model number
- Machine serial number
- Voltage rating
- Color

This information will be found on the serial number plate attached to the machine. Please also quote the page and part number required.

Spares can be ordered directly from the manufacturer or by contacting your local agent.



For Safety and Optimum Performance only use GenuineStrip Tec Parts

Strip Tec 3700 N. Commerce Fort Worth, Texas 76106



## 8.2. Shear Body & Guard



## 8.3. Hydraulic Ram



## 8.4. Infeed Clamp



8.5. Hydraulic Power Pack – Electric Models



## 8.7. Stroke Adjuster Mechanism



## 9. <u>Record Keeping</u>

#### 9.1. Useful Contacts

If you require any additional generic safety or operational information on the use of hydraulic alligator shears, or other scrap metal processing equipment, then the following contacts may be of assistance:

Institute of Scrap Recycling Industries, Inc (ISRI) 1325 G Street NW, Suite 1000, Washington DC 20005-3104, USA Tel: +1 202/737-1770, Fax:+ 1 202/626-0900 www.isri.org email: isri@isri.org

American National Standards Institute (ANSI) 1819L Street, NW, Washington, DC 20036, USA Tel: +1 202/293-8020, Fax: + 1 202/293-9287 General enquiries: + 1 202/642-4900 www.ansi.org

Occupational Safety & Health Administration (OSHA) Office of Public Affairs – Room N3647 200 Constitution Avenue Washington, DC 20210 Tel: +1 202/693-1999 www.osha.gov

Strip Tec 3700 N. Commerce Fort Worth, Texas 76106 www.striptec.com



#### 9.2. Training, Safety & Ownership Records

The following pages are provided for photocopying as required.

- Operator Training Record
- Shear Safety Checklist
- Owner Registration Form

## 10. Operator Training Record

This Operating and Instruction Manual must be read before operating the equipment.

- It is the owner's responsibility to ensure that all operators are fully trained in the use of this equipment, and that each individual operator is given access to this manual.
- All operators should be fully trained in safe working practices, and be fully familiar with the safety features of this equipment, which include the Blade Guard, Foot Pedal, Cables and Warning Labels, and their correct usage.
- No unauthorised persons should operate this machine. No persons under the age of 18 should operate this machine.

For your protection, and for the safety of the operators, we have included the following record:

I have read this Operating and Instruction Manual and I am fully familiar with the safety features on this equipment. I understand that scrap metal processing can be hazardous and the importance of correct working practices:

Machine Owner:	Signature	Date
1st Operator	Signature	Date
2nd Operator	Signature	Date
3rd Operator	Signature	Date
4th Operator	Signature	Date
5th Operator	Signature	Date
6th Operator	Signature	Date
7th Operator	Signature	Date
8th Operator	Signature	Date
9th Operator	Signature	Date
10th Operator	Signature	Date
11th Operator	Signature	Date
12th Operator	Signature	Date
13th Operator	Signature	Date
14th Operator	Signature	Date
15th Operator	Signature	Date
16th Operator	Signature	Date
17th Operator	Signature	Date

Attach additional sheet for subsequent operators if necessary

## 11. Shear Safety Checklist

Shear Model: .....

Serial Number:....

#### 11.1. Warning Signs

Check that all Signs and Warning Labels are in place and in good, legible condition:

- □ Safety Instructions
- Protective Clothing Warning Sign
- Two Shear Hazard Labels
- Read Instruction Manual Label
- □ Foot Pedal Warning Label
- Inflammable Liquid Label

#### 11.2. Machine Integrity

Check the following:

- Shear Blades must be intact, seated correctly, free from chips or cracks
- Loose, missing or Damaged items
- □ Working area must be free from obstruction, debris, oil and metal
- □ Ventilation Grills must be free from obstruction
- Blade Guard must be properly fitted and intact

#### **11.3. Control Functions**

Check the following Control Functions for correct operation:

- Mains Isolator
- Start Button
- Stop Button
- Foot Pedal
- Stroke Adjuster

Report all Problems to the Supervisor Immediately

Checked By (Print):

Signature:

Date:

Photocopy for use as required

## 12. Ownership Registration

If you have purchased your STI shear second-hand, then please copy this form and use it to fax your details back to us. This will allow us to keep you informed of any updates relating to your equipment.

Contact:
Company Name:
Address:
Telephone:
Fax:
Email:
Type of equipment:
Model:
Serial Number (shown on black plate):
Color of equipment:

Strip Tec www.striptec.com

